

PVG's
Muktangan English School & Jr. College, Pune - 9
Terminal Examination (2024-25)
Standard - X

Subject - MATHEMATICS (Part I)

Marks - 40

Date - 23-10-2024

Time - 8.00 a.m. to 10.00 a.m.

Q.1 (A) Four Alternative answers for each of the following subquestions are given. Choose the correct alternative and write its alphabet. (4)

- 1) A tax levied by the central government for trading within state is
 (A) IGST (B) CGST (C) SGST (D) UTGST
- 2) For which of the following equations is $\alpha.\beta=5$, where α & β are roots of the equations.
 (A) $2x^2 + 10x + 25 = 0$ (B) $3x^2 + 15x + 16 = 0$
 (C) $x^2 - 10x + 25 = 0$ (D) $3x^2 - 15x + 15 = 0$
- 3) What is the common difference of the A.P. : 10, 11.5, 13, 14.5,
 (A) 1.5 (B) -1.5 (C) 2.5 (D) -2.5
- 4) Find the value of the determinant. $\begin{vmatrix} 3 & 4 \\ 1 & 5 \end{vmatrix}$
 (A) -11 (B) 11 (C) 9 (D) -9

Q.1 (B) Solve the following subquestions : (4)

- 1) Find the values of a, b and c for the following quadratic equation by comparing with general form $ax^2 + bx + c = 0$.
 $x^2 - x - 3 = 0$
- 2) Write the first two terms of an A.P. if $a = 10$ and $d = 5$.
- 3) On a certain article, rate of GST is 28% find the rate of SGST and CGST.
- 4) For the simultaneous equations in x & y, find the value of y if $D_x = 12$, $D_y = 6$ and $D = 3$.

Q.2 (A) Attempt any two of the following subquestions. (4)

- 1) Complete the following table to draw the graph of $x - y = 1$

x	0	<input style="width: 40px; height: 15px;" type="text"/>
y	<input style="width: 40px; height: 15px;" type="text"/>	0
(x,y)	<input style="width: 40px; height: 15px;" type="text"/>	<input style="width: 40px; height: 15px;" type="text"/>

- 2) If $x = 5$ is the root of the equation $kx^2 - 14x - 5 = 0$, then find the value of k by completing the following activity.

Solution : One of the roots of the equation $kx^2 - 14x - 5 = 0$ is 5

∴ It satisfies the equation

∴ substitute $x = 5$ in the equation, we get,

$$k \boxed{}^2 - 14 \times \boxed{} - 5 = 0$$

$$\therefore \boxed{} k - 70 - 5 = 0$$

After solving,

$$k = \boxed{}$$

3) Complete the following table by writing suitable numbers and words.

S.No.	F.V.	Share is at	M.V.
(i)	Rs. 100	Par	<input type="text"/>
(ii)	<input type="text"/>	Premium Rs. 500	Rs. 575
(iii)	Rs. 10	<input type="text"/>	Rs. 5
(iv)	Rs. 50	Discount Rs. 10	<input type="text"/>

Q.2 (B) Attempt any four of the following subquestions :

(8)

- 1) Solve the following quadratic equation by using factorization method.
 $x^2 - 15x + 54 = 0$
- 2) Find t_{12} for the A.P. 12, 9, 6,
- 3) Express the following information in mathematical form using variable x and y .
The length of a rectangle is greater than the breadth by 2 cm and perimeter of a rectangle is 40 cm.
- 4) Ashok purchased 150 shares of F.V. Rs. 100 and for M.V. Rs. 120. Company paid the dividend at 6%. Find the rate of return on his investment.
- 5) Check whether the following equation is quadratic or not and justify your answer.

$$\frac{5}{x} - 3 = x^2$$

Q.3 (A) Complete any one of the following activities.

(3)

- 1) Raj chemicals paid Rs. 80,000 GST for purchase of some chemicals and collected G.S.T. of Rs. 95,000 at the time of sale. Find the amount of G.S.T. payable by Raj Chemicals by completing the following activity.

Solution :

Output tax =

Input tax =

$$\therefore \text{ITC} = \text{Rs. } 80,000$$

$$\therefore \text{G.S.T. payable} = \boxed{} - \boxed{} \dots\dots\dots [\text{formula}]$$

$$= \boxed{} - 80,000$$

$$= \boxed{}$$

2) Complete the following activity to find the two digit numbers which are divisible by 4.

Solution :

Two digit numbers divisible by 4 are 12, 16, 20, 96

$$\therefore a=12, d=4, t_n = 96$$

$$t_n = a + (n-1)\boxed{} \dots\dots\dots \text{Formula}$$

$$96 = 12 + (n-1)\boxed{} \dots\dots\dots [\text{Substituting the values}]$$

$$(n-1)\boxed{} = \boxed{} - 12$$

$$n - 1 = \boxed{\frac{}{}}$$

After solving

$$n = \boxed{}$$

\therefore There are $\boxed{}$ two digit numbers divisible by 4.

Q.III (B) Attempt any two of the following subquestions. (6)

- 1) If α and β are the roots of the quadratic equation $x^2 - 4x - 6 = 0$. Find the value of $\alpha^2 + \beta^2$.
- 2) Find the value of $x + y$ and $x - y$ for the following equations. :
 $3x + 4y = 11$
 $4x + 3y = 10$
- 3) Find 'm' if the quadratic equation $(m-12)x^2 + 2(m-12)x + 2 = 0$ has real and equal roots.
- 4) Find t_n for an A.P. 3, 8, 13, 18, hence find t_{20} .

Q.IV Attempt any two of the following subquestions. (8)

- 1) Pratik travels by boat 36 km downstream and back in 8 hrs. If the speed of the boat in still water is 12 km/hr. Find the speed of water current. .
- 2) Solve the following simultaneous equation by using graphical method.
 $x - 3y = 1$; $3x - 2y + 4 = 0$

- 3) If m times the m^{th} term of an A.P. is equal to n times its n^{th} term, then show that $(m + n)^{\text{th}}$ term of the A.P. is zero.

Q.V Attempt any one of the following subquestions.

(3)

- 1) Prepare Business to Consumer (B2C) tax invoice using the given information. Write the name of the supplier, address, state, date, invoice number, GSTIN number as per your choice.

Particulars : 1) Rate of mobile battery - Rs. 200

Rate of GST = 12%

Quantity = 1 pc

2) Rate of Head phone = Rs. 800

Rate of GST = 18%

Quantity = 1 pc.

- 2) Out of a group of swans $\frac{7}{2}$ times the square root of number of swans are playing on the shore of the tank. Remaining two are quarreling in the water. Calculate the total number of swans.

